

REMARKS**I. STATUS OF THE CLAIMS**

New claims 12-19 are added.

In view of the above, it is respectfully submitted that claims 1-4 and 8-19 are currently pending.

**II. REJECTION OF CLAIMS 1-4 AND 8-11 UNDER 35 USC 102(B)
AS BEING ANTICIPATED DIGIOVANNI, USP 5,406,404**

The present invention as recited, for example, in claim 3 as amended herein, relates to an optical transmission system comprising (a) an optical transmitter transmitting a WDM optical signal including a plurality of optical signals with different wavelengths; (b) a multi-stage optical amplifier; and (c) an optical receiver receiving the amplified WDM optical signal from the multi-stage optical amplifier.

As recited, for example, in claim 3, the multi-stage optical amplifier is to amplify the WDM optical signal from the optical transmitter with substantially equal gain over the wavelengths of the optical signals. Moreover, as recited, for example, in claim 3, the multi-stage optical amplifier includes (i) a first-stage optical amplifier which amplifies the WDM optical signal, (ii) a level controller which controls a power level of the WDM optical signal amplified by the first-stage optical amplifier, and (iii) a second-stage optical amplifier which amplifies the WDM optical signal of which level is controlled by the level controller.

Please note that the claims are amended herein to recite a "multi-stage" optical amplifier.

DiGiovanni discloses a plurality of optical amplifiers dispersed along a transmission line. It is respectfully submitted that DiGiovanni does not disclose or suggest a "multi-stage" optical amplifier including a first-stage optical amplifier, a level controller and a second stage optical amplifier, as recited, for example, in claim 3.

* * *

FIG. 1A of DiGiovanni discloses the use of variable attenuators 2. However, the variable attenuators 2 in FIG. 1A of DiGiovanni are used in a substantially different manner than the level controller recited, for example, in claim 3. For example, as indicated in column 3, lines 21-36, of DiGiovanni, variable attenuators 2 are simply used to represent fiber or splitting loss in the test system of FIG. 1A. These attenuators of DiGiovanni are NOT used in a multi-stage optical amplifier having a first-stage and a second-stage to amplify a WDM optical signal with substantially equal gain over wavelengths as recited, for example, in claim 3.

Further, the attenuators of DiGiovanni are NOT used as variable optical attenuators in the manner recited, for example, in dependent claims 8-11.

* * *

DiGiovanni is directed to mitigating gain peaks in a chain of fiber amplifiers, by controlling the pump light provided to the amplifiers. See, for example, the Abstract; column 2, lines 29-40, of DiGiovanni.

Column 3, lines 59-68, of DiGiovanni, discloses:

"In addition to SNR, the variation in gain or output power of the chain of amplifiers with signal wavelength may also be of importance depending upon the dynamic range of the particular receiver used. FIG. 5 shows the output power of the amplified signal after each amplifier, normalized such that the output at the peak wavelength of each amplifier is set to 0 dB. Again, as expected, the difference between the extreme channels and the center channels increases on passing through each amplifier."

Further, column 3, lines 46-50, of DiGiovanni discloses:

"The SNR varies little with wavelength after one amplifier. However, after passing through four amplifiers there is a significant decrease in the SNR at the shortest and longest wavelengths compared to the center."

Therefore, DiGiovanni discloses that

- (1) the difference of gain between the extreme channels and the center channels increases on passing through each amplifier; and
- (2) there is a significant decrease in the SNR at the shortest and longest wavelengths compared to the center after passing through a plurality of amplifiers.

Accordingly, DiGiovanni suggests the negative impact on the WDM optical signal after passing through a plurality of optical amplifiers dispersed along an optical transmission line. However, DiGiovanni recognizes that, in long haul transmission systems, it is necessary to have a plurality of optical amplifiers dispersed along the optical transmission line. To address the negative impact of the plurality of optical amplifiers, DiGiovanni relates to wavelength of the pumping light of the optical amplifiers.

As DiGiovanni suggests the negative impact on the WDM optical signal after passing through a plurality of optical amplifiers dispersed along an optical transmission line, DiGiovanni

can be seen as "teaching away" from employing a multi-stage optical amplifier to amplify a WDM optical signal with substantially equal gain over the wavelengths of the optical signals as recited, for example, in claim 3.

* * *

Although the above arguments are specifically directed to claim 3, it is respectfully submitted that the arguments would be helpful in understanding differences in various other claims over DiGiovanni.

In view of the above, it is respectfully submitted that the rejection is overcome.

III. NUMBER OF REFERENCES CITED

The Examiner notes that a large number of references have been cited in this application.

This application claims the benefit of several other applications in the chain of prosecution. Many of the references were cited in the prior applications in the chain of prosecution. The references were again cited in the IDS filed March 4, 2002, in the present application, so that the references would be printed on the face of any patent issuing from the present application. MPEP 609 (I)(2) indicates that information from a prior parent application will be considered by the Examiner in a continuation application, but that "such information need not be resubmitted in the continuing application unless the applicant desires the information to be printed on the patent". Accordingly, the information was resubmitted in the present application so that it would be printed on any resulting patent.

IV. CONCLUSION

In view of the above, it is respectfully submitted that the application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

Serial No.: 10/086,742


Docket No.: 614.1747CD2C

If any further fees are required in connection with the filing of this response, please charge such fees to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: June 9, 2004

By: 
Paul I. Kravetz
Registration No. 35,230

1201 New York Avenue, NW, Suite 700
Washington, D.C. 20005
Telephone: (202) 434-1500
Facsimile: (202) 434-1501